



CALIFORNIA TRANSPORTATION

# Journal

Volume 1 | Issue 2

WOULD YOU BELIEVE THIS IS  
THE 'CENTER OF POPULATION'  
FOR CALIFORNIA?



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COVER STORY: How  
California's Western Kern  
County became the State's  
"center of population"

BACK COVER: Caltrans  
Equipment shop; photo  
by Don Tateishi



# CALIFORNIA TRANSPORTATION Journal

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# Message from the Caltrans Director

Welcome to the second edition of the award winning *California Transportation Journal (Journal)*, the quarterly publication that aims to keep our partners and the transportation community abreast of the California Department of Transportation's activities.

I am proud to say "award winning." The inaugural edition, published in February, has already won a third-place award in the Winter Semi-Annual Design Contest of the American Design Awards.

The *Journal* also received three Communicator Awards — the "Award of Distinction" for Writing/Newsletter, Design/Newsletter and Newsletter/Government, as well as an Honorable Mention for the Design/Newsletter Interior category.

That's important, since Caltrans and its 20,000-plus dedicated employees are making a real attempt to "show the chrome" — that is, to present our best and our brightest selves to the rest of the world. We believe the *Journal* is one way to do that.

Our stories might come from almost any quarter, but they attempt to show the innovation, resourcefulness, quality and strong partnerships Caltrans is committed to investing in its projects, programs and initiatives.

For example, this issue's lead story explores the partnership Caltrans forged with the California Land Surveyors Association, U.S. Census Bureau, National Geodetic Survey and California Spatial Reference Center to pinpoint California's "center of population" (COP).

Finding the COP is just one way that Caltrans surveyors apply their trade. They employ GPS (and its highly

accurate geographical data) to aid earthquake research, infrastructure monitoring and emergency responses. However, finding the COP excites the popular imagination, and readers may be surprised at the COP's location in the country's most populous state.

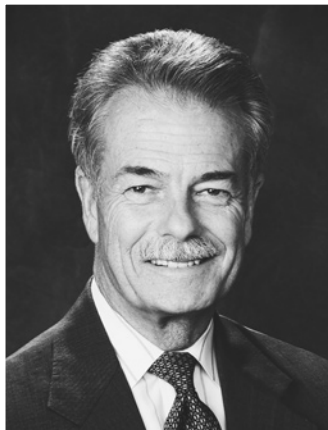
Caltrans found a way to build bridges in the San Francisco Bay while protecting aquatic wildlife, and won a Federal Highway Administration award in the process. The innovative "bubble curtain" protects fish and other animals from the harmful noise caused by engineers driving support piles into the Bay's mud floor.

An article on this winter's storms and the California Highway Information Network (CHIN) show how successfully Caltrans has been able to get the word out about highway and weather conditions. Californians in the hundreds of thousands called the CHIN line for information during a series of storms in December, January and February.

In two other articles — one about bicycle stations and another about a highly successful Caltrans-owned truck assembly line — the Department shines the light on alternative mobility and shows how to save money in acquiring specialized transportation equipment.

These stories have something in common. They exemplify the Department's energy, its commitment and its high-quality approach to providing the best transportation system in the country.

I think you will find this issue to be useful reading, and I hope you enjoy it.



A handwritten signature in black ink that reads "Will Kempton" followed by a long horizontal flourish.

Will Kempton, Director



*By Mark S. Turner, PLS*

*Chief, Office of Land Surveys*

*Caltrans Division of Right of Way and Land Surveys*

# California's Center of Population Monument

Where are all the people  
and why are they moving?

*Imagine, if you will, a kind of pre-Columbian worldview*

*in which the earth — and particularly California —*

*is a flat, rigid, weightless surface. Moreover, think*

*of the state's entire population with each of the*

*35 million people weighing exactly the same.*

*(continued on page 4)*



IRONICALLY, IN A  
COTTON FIELD...  
AMID THE VAST  
OPEN TRACTS  
OF WESTERN  
KERN COUNTY...  
IS THE IMAGINARY  
BALANCE POINT  
USED TO ANALYZE  
(CALIFORNIA'S)  
POPULATION  
DISTRIBUTION  
AND CHANGE.



## Where, Then, Would the Perfect Balance Point Be?

According to the 2000 census, the “center of the population” (COP) for America’s most populous state lies, ironically, in a cotton field between the communities of Shafter (pop. 13,700) and Buttonwillow (pop. 1,300) amid the vast open tracts of western Kern County.

It is a surrealistic concept, but true.

The next question becomes, “How do experts determine the location of this center of population and why is it so important to demographers, surveyors, engineers, planners, the geophysical community, the business community and local officials?”

## Why Is This Important?

Modern society increasingly needs accurate and reliable geographic data for making critical decisions in such varied activities as environmental monitoring, the effects of urbanization, flood plain management, civil infrastructure management, earthquake research, and emergency response. Organizations and individuals are working together to develop systems to meet today’s spatial referencing needs.

Business leaders and local officials have also realized the COP’s significance. Many large warehousing and manufacturing operations in Kern County are within a 40-mile radius of the COP and are strategically positioned to distribute products around the state. The 1880 center of population in San Joaquin County is now home to large operations serving major Northern California population centers.

## “So What?” Some Might Ask

One reason is simply to showcase improvements in Global Positioning System (GPS) technology, its adaptation by land surveyors, and the developing cooperation between federal, state, local, and private surveying and mapping professionals.

On October 16, 2004, local officials joined the project sponsors and members of the Bakersfield Chapter of the California Land Surveyors Association to dedicate a COP monument at the median island of the Buttonwillow Rest Area, approximately 30 miles west

.....

*Using a variety of equipment, Caltrans surveyors perform a number of tasks from keeping track of the earth’s seismic movements to measuring the rising and falling of its crust. Recently, they even helped to determine the state’s “center of population.”*

of Bakersfield, along southbound Interstate 5 (two miles north of Highway 58).

What better way is there to educate citizens about land surveying and the unique and powerful forces that “move and shake” California’s population?

### How the ‘COP’ Is Determined

Not to be confused with California’s geographic center — 118 miles north in Madera County — the center of population is the imaginary balance point used to analyze population distribution and change. In simple terms, it is the single point that is closest to all the people in the state.

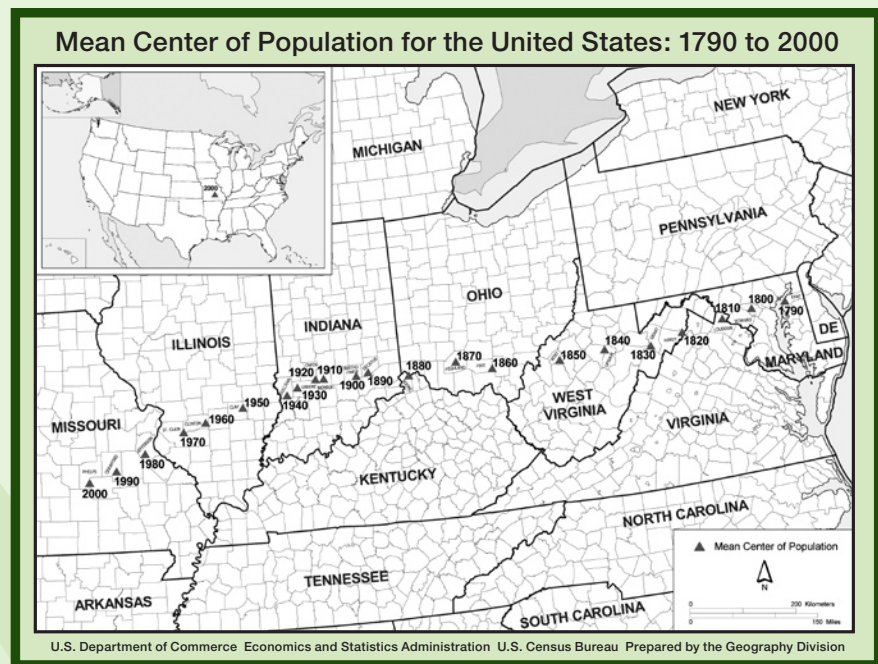
To calculate the center of America’s population, the U.S. Census Bureau compiled and analyzed 2000 census data and computed coordinates for the point that had the shortest distance to the centers of all of the census tracts. The result is a latitude and longitude that can be shown on a map and can be physically located on the ground. The Census Bureau has kept these statistics for California since 1880.

In addition to the national goal of marking each state’s COP, a survey monument rests at the nation’s center of population, Phelps County, Missouri.

One thing is clear: California has had an unmistakable influence on the nation’s COP through the decades. Even though California’s COP has remained in Kern County for 70 years, its pull on the nation’s population center remains a steady and powerful force.

An examination of California’s COP from 1880 to 1960 shows a predictable shift to the southeast. Southern California’s population grew rapidly, drawing the center toward Los Angeles. Interestingly, the movement of the state’s population center over the decades since 1880 roughly follows the alignment of Interstate 5 and the California Aqueduct, two major arteries constructed to accommodate the state’s growth.

Between 1960 and 1990, the COP stabilized, shifting slightly more toward the east. Between 1990 and 2000, the center began to slide to the northeast, reflecting the population growth in Northern and Central California, especially along Highway 99.



### Surveyors’ Involvement

As the state’s population has grown, its transportation needs have broadened over the last century. Surveyors make up the one profession that links all the elements of a transportation project: from conception to planning, through design, land acquisition, construction, final monumentation, and map recordation.

Surveyors provide relevant data about the shape, contour, location, elevation, or dimension of land features. Therefore, the COP — a single, tangible point in space — can grab the public’s attention. It can also provide a valuable surveying monument for the National Spatial Reference System (NSRS). The NSRS provides a consistent coordinate system that defines latitude, longitude, height, scale, gravity, and orientation throughout the United States.

Surveyors from Caltrans District 6 (Fresno) and the California Land Surveyors Association worked to design and place the monument in a suitable location. In a collaborative venture, Condor Earth Technologies made the surveying measurements, under contract with the California Spatial Reference Center. The monument is now part of a network of more than 100 stations in the San Joaquin Valley Height Modernization Project, developed to obtain new or updated horizontal coordinates and heights (elevations).

Using Global Positioning System (GPS) technology, surveyors performed observations at the monument over two days, collecting data an hour each day to meet project requirements. Additional observations ensured that the survey monuments achieved a positional accuracy of one to two centimeters horizontally and

two to five centimeters vertically, relative to other NSRS stations in the vicinity. The California Spatial Reference Center is processing the data, and expects the National Geodetic Survey to approve it for inclusion in the NSRS database.

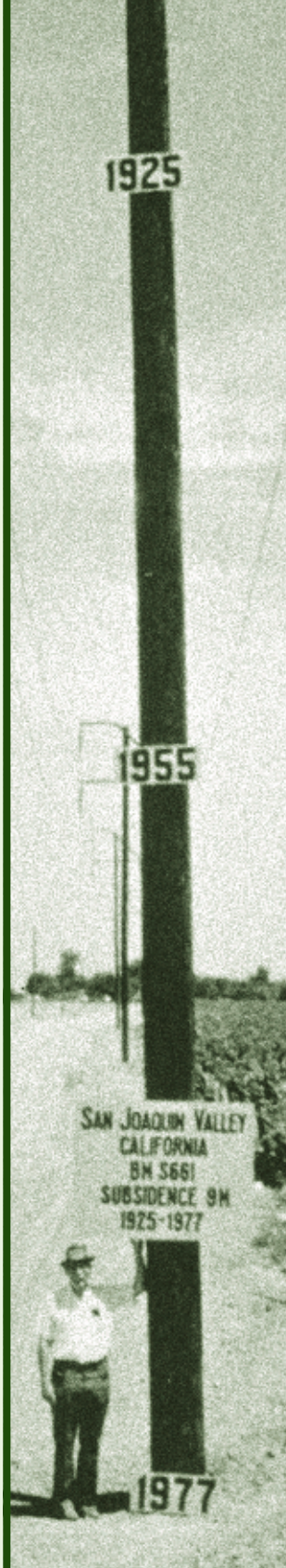
### Crustal Motion and Subsidence

Establishing coordinates on surveying monuments in California requires considering the movement of the earth's crust. Powerful tectonic forces shape California's diverse and beautiful landscape. The state is torn between the North American Plate and the Pacific Plate. Generally, the split occurs along the San Andreas Fault.

Creeping motion at the junction of these plates can cause the earth's crust to warp as much as five centimeters a year. In addition, earthquakes can result in horizontal displacements of as much as five meters, such as the 1992 Landers earthquake. The Cape Mendocino temblor that same year caused a vertical displacement of more than a meter.

Many areas of the state (Central Valley, Lancaster/Edwards Air Force Base, and Long Beach) also experience land subsidence, or sinking, due to water, oil or gas extraction. A benchmark near Mendota in the San Joaquin Valley had a measured subsidence of 24 feet between 1943 and 1966. The elevation is unknown today because the benchmark no longer exists.

With the advent of GPS surveying and improvements in measurement technology, land surveyors now require more accurate coordinates for geodetic control. Geodetic surveying takes into account the shape and size of the earth to determine horizontal and vertical positions. The National Geodetic Survey, in conjunction with partners such as Caltrans, has been remeasuring and refining the coordinate system.



*Dr. Joe Poland stands next to a benchmark showing area land subsidence from 1925-1977.*

PHOTO COURTESY  
OF THE U.S.

GEOLOGICAL SURVEY

In addition, GPS allows surveyors to establish both horizontal coordinates and heights on the same geodetic marker. Getting accurate heights using GPS requires proximity to the historical benchmarks as well as stringent observation techniques. This commemorative monument is unique among the states because it is the only one, thus far, that has both horizontal and vertical values.

### Where Do We Go from Here?

California's population has increased dramatically over time. The state is home to more than 36 million people, a 16 million increase in 30 years. It took 100 years to reach the 10 million mark. Since then, California has been adding 10 million people every 20 years.

Will future census data show that transportation has had an impact on the inevitable population shift? Or will the population shift have an impact on transportation? By 2010, barring major earthquakes in the area, the 2000 COP itself is predicted to move about one foot in a northwesterly direction.

Whatever the future holds, California's professional surveyors will be back to set and measure another commemorative survey mark for Californians to contemplate and enjoy.

California's COP project was co-sponsored by the California Land Surveyors Association, U.S. Census Bureau, National Geodetic Survey, California Spatial Reference Center, and Caltrans.

A video of the dedication ceremony was taken and will be made available on the CLSA website at: <http://californiasurveyors.org/> •



*Innovative  
“Fish Friendly”  
Technology-Science  
Partnership Reels  
in FHWA’s  
Environmental  
Excellence Award*

# Award-Winning Innovation Protects the Environment

By Keith Jones P.E.

Senior Transportation Engineer

and Deborah C. McKee

Senior Transportation Planner

CALTRANS AND SEVERAL of its partner agencies and consultants recently won the Federal Highway Administration’s (FHWA) 2005 Environmental Excellence Award for Excellence in Ecosystems, Habitat, and Wildlife. The award promotes outstanding partnerships that demonstrate resource management, innovative approaches to preserve ecosystem integrity, and integration of environmental stewardship into the planning and project development process.

*(continued on page 8)*



FISH FOUND A FRIEND  
IN A CALTRANS  
“BUBBLE CURTAIN”  
DURING WORK ON THE  
NEW SAN FRANCISCO  
OAKLAND BAY BRIDGE.

### How Did This Begin?

The new San Francisco Oakland Bay Bridge (SFOBB) East Span Project is designed as a critical lifeline structure, in the event of a major earthquake. The foundation uses steel pipe piles with reinforced concrete cores to resist seismic forces. A test pile program during the fall of 2000 drove eight-foot diameter steel test piles 350 feet through Bay mud, down to firm substrata.



Driving the colossal piles required one of the world's largest hydraulic hammers, capable of delivering 1.25 million foot-pounds per blow. At the time, the Department was concerned that intense underwater noise from each hammer stroke could potentially injure or even kill sensitive marine life in the Bay.

The test incorporated a “bubble curtain” to shield marine mammals and fish in the project area. A bubble curtain could be described as a circular wall of bubbles generated from a perforated pipe, sitting on the mud line, and charged with compressed air.

Though bubble curtains have proven to reduce shock waves from explosive blasts, this technology was new to bridge projects. As a reference, one pile was driven without a bubble curtain, while a second was shielded by a bubble curtain similar to one used in Hong Kong to protect dolphins.

Shortly after engineers began to drive the unprotected pile, a number of anchovies — apparently stunned from the noise — floated to the surface. In a scene reminiscent of Alfred Hitchcock's “The Birds,” gulls appeared out of nowhere, wheeling, careening, and competing for the floating fish. When the driving ceased, no more floating fish were seen and the birds dispersed.

In contrast, during the second pile drive, the bubble curtain shielded fish from the noise. No fish were seen floating, and the gulls lost interest. Clearly, the bubble curtain system was beneficial for protecting sensitive aquatic species.

### Advanced “Fish Friendly” Bubble Curtain Technology

The SFOBB Skyway contract included specifications for a multi-level bubble curtain with a high bubble density for use during high tidal currents. However, before the project started, work began on the new Benicia-Martinez Bridge using a hammer with an energy rating of less than a third of that to be used at SFOBB.

Immediately after engineers started the first pile, a large bass floated to the surface. Because the location is a habitat for numerous protected species, including salmon and steelhead, construction was halted and emergency consultations with the resource agencies began.

Deep water and fast currents at Benicia would disrupt the protection of a bubble curtain, requiring a new solution. Driving piles in cofferdams prevents fish mortality due to the air buffer around the pile, but the water was too deep for this approach.

As a solution, an isolation casing was placed around the pile to provide an air gap. Instead of pumping the water out, a bubble curtain was placed in between. The result virtually dewatered the pile. Although the isolation-casing test was successful, it interfered with the contractor's extensive template used to guide the piles. The cost to modify the template was prohibitive.

However, a variation of the bubble curtain resulted in a solution without disrupting the contractor's operation. Dubbed the "bubble tree," its nine vertical levels spaced five feet apart provided coverage in deep, fast moving currents. Each level had a quarter segment of a perforated ring pipe, affixed to an H beam. The system, as tested, consisted of four bubble trees placed around the pile within inches of its wall, which were fed with abundant air.

The results were astounding, and had never before been achieved with bubble curtain technology. It removed more than 99 percent

of the noise energy! Its success allowed the project to resume uninterrupted, while fully protecting fisheries' resources. Afterward, Caltrans was granted a patent for the bubble tree system.

Lessons learned from the Benicia bubble tree were applied at SFOBB. Bubble curtains have been used successfully on the Skyway and other projects. These technological advancements developed by Caltrans established the "state of the art" in fish friendly pile-driving practices. This technology will have a tremendous benefit for similar work in the future within California and beyond.

### Streamlining Process Through A Collaborative Science Program

Nearly every west coast estuary and stream provides habitat for fish species protected under the federal and state endangered species acts. Federal protection agencies are required to ensure that projects will not harass, harm or otherwise limit the viability of these species, or their habitats. In analyzing the project's effects, the agency uses the available information, but it must be credible, reliable, and represent the best scientific data available.

Before the SFOBB project, most work of this nature pertained to explosives. Because explosives produce pressure waves with unique shapes, intensities, and frequencies, their impacts do not directly compare to pile-driving. Lack of pile-driving noise data, and its effect on fish, required resource agencies to rely on highly conservative analyses of existing information, including anecdotal data.



For the SFOBB biological studies, Caltrans retained several preeminent experts in underwater noise and sound effects on fish. They reported the project's prospects of protecting fish from pile-driving noise. Caltrans also held educational workshops that brought together pile-driving experts, acoustic engineers, scientists, fish hearing and sound biologists, state and federal regulators, and industry representatives. The workshops made clear the need for a standard approach to address marine pile-driving projects.

Factors included a protocol for characterizing and monitoring pile-driving noise; Caltrans again retained the experts who evaluated literature applicable to noise impacts on fish, including noise resulting from pile-driving activities in aquatic environments. Their report, "The Effects of Sound on Fish," identifies thresholds, metrics for noise criteria, and compliance guidance based on current knowledge.

In order to streamline the development process, Caltrans in partnership with the FHWA established a west coast multi-agency fisheries "noise working group." The group consisted of staff from Caltrans, Oregon and Washington departments of transportation, FHWA, California Department of Fish and Game, U.S. Army Corps of Engineers, NOAA Fisheries, and

the U.S. Fish and Wildlife Service. A panel of recognized experts from research institutions, agencies, and consulting firms supported the group.

So far the working group's efforts have resulted in an agreement in principle among member agencies that "The Effects of Sound on Fish" adequately captures the best and most recent available science. The group also adopted the recommended interim thresholds. For new projects involving pile-driving in protected marine habitats, this means quicker agreements based on biologically relevant science, and consistent and predictable project measures for the protection of fish.

The Working Group was also charged with identifying needed research to resolve uncertainties about pile-driving noise and its effect on fish. Their effort has formed the basis of a research program funded by the National Academy of Sciences' Transportation Research Board. •




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*Caltrans is required by Federal law to ensure that engineering projects will not harm endangered species or their habitats. The "bubble curtain" ensured that noise from pile-driving would not harm aquatic life or marine mammals in the San Francisco Bay.*

PHOTOS COURTESY OF DISTRICT 4



# Caltrans Has an Answer for Specialized Equipment:



IT IS WELL known that the California Department of Transportation builds, operates and maintains the State Highway System as part of the larger, multimodal California transportation network.

However, the Department has another function. Very few people know that the Caltrans Division of Equipment in Sacramento actually builds Caltrans trucks and other working equipment seen every day on the highways.

In fact, Caltrans has the most extensive fabrication operation of any department of transportation in the United States.

“We’ve found over the years that we really cannot buy what we need on the open market,” explained Kris Teague, Chief of Engineering and Production for the Division.

He added, “There is no such thing as a dump truck store. You either buy from a truck dealer who subs out the dump body or you buy from the dump body maker who subs out the truck. Based on our experience and user needs, we design our equipment, such as trucks to plow snow, put down Botts Dots, or repair guardrails for productivity, safety, and reliability.”

The Division began this line of work back in 1921, in a blacksmith shop that shod mules and converted WWI Liberty Trucks into highway



## The Division of Equipment Simply Cranks up the Assembly Line

*By John Robin Witt*  
*Editor, California Transportation Journal*

maintenance units. Today, it provides whatever the Department needs — some 700 types of equipment that comprise the Department’s 14,000-vehicle fleet.

*(continued on page 14)*



## Caltrans builds its own “bread and butter” trucks.

Although manufacturers supply complete units such as cars, pickups, trailers, specialty cranes and equipment, the Division coordinates design, specifications, purchasing and assembly for specialized equipment. Units are put into service at Division Headquarters at 34th Street and Stockton Boulevard in Sacramento, with help from the 12 District shops throughout the state.

For example, between December and February the shop put together 49 newly redesigned four-yard plow trucks.

“It’s a bread and butter truck, for use in patch jobs, carrying material, plowing snow or all sorts of other jobs — you name it,” said Teague. The term “four yard” refers to the four yards of dirt, gravel or snow the dump body can hold.

The shop purchased major components from suppliers and assembled a truck cab, chassis, body, and plow to form the specialized dump truck.

“Using this method, we can concentrate on building in quality and reliability,” said Teague. “Since we are responsible for the maintenance of these units over the next 10 to 15 years, we have a vested interest in that.”

“There were growing pains in the process of building a completely redesigned truck, but the final product should greatly enhance the operations of our customers,” said Angela Wheeler, a Senior Equipment Engineer who oversaw the redesign process. “We incorporated requests and comments from the users to make the truck more user friendly.”

For example, the tire chains are now stored lower on the truck for easier access, and the toolbox has room to accommodate a lunch box.

The Division redesigned the truck to handle a greater payload, an increase of 1,500 pounds. The redesign lightened the vehicle by incorporating a front-telescoping hoist instead of a bulkier underbody hoist. The trucks now weigh approximately 21,000 pounds and can haul a payload of 12,000 pounds — for a total gross weight of 33,000 pounds.

This redesign had a side benefit as well. “The old body style served us well for 22 years. But with steadily increasing steel prices, the reduction in weight equates to a real cost savings,” said Wheeler.

.....  
*It's difficult to buy specialized road-working equipment off the shelf. Consequently, Caltrans often builds its own, at the Division of Equipment Headquarters in Sacramento. This permits the Department to concentrate its efforts on quality and reliability.*

The new unit also incorporates a state-of-the-art "Multiplex" electrical system. This system reduces the amount of wiring and hardware installed in the truck, making it more streamlined trouble-free, and efficient.

The shop began the process by incorporating the latest design changes into a prototype truck, which users then reviewed. After evaluating their comments and making any necessary changes, the shop set up the truck assembly line.

On a cold December day, 25 employees moved the first 25-foot-long International cab and chassis onto the assembly line. Over the next three months, 48 more moved down the line — each fitted with specified equipment such as front and side plows, wiring, cab guards, tool boxes, hydraulics, consoles, lights, baskets and emulsion tanks. Quality inspection, paint, certification and shipping were the last tasks to be done. The Division of Equipment certifies all equipment it assembles.

The Division supplies an average of 800 to 1,000 large pieces of new equipment to various

Caltrans programs every year — setting a record of 2,226 units in one year.

The Division also has another distinction, leading the way to cleaner air by using viable, emerging "green" technologies, staying ahead of government regulations. The bottom line is lowered emissions for the fleet.

The methods employed include hybrid passenger vehicles (powered by both electricity and gasoline) that exceed 40 mpg, solar-powered equipment (to replace diesel or gasoline power), clean burning compressed natural gas (CNG) and propane-fueled vehicles, low dust producing street sweepers, and retrofitting heavy-duty, diesel-powered vehicles with emissions-reducing devices. In addition, Caltrans is delivering ultra-low-sulfur diesel to many of its fueling stations.



It has been an ambitious program. Caltrans has the largest and most diverse mobile fleet in California with approximately 14,000 on- and off-road vehicles. Through its partnership with the Air Resources Board, the Division has made Caltrans the state's leading agency in improving air quality.

It's been worth the work. With sustained partnerships, combining the skills and input of mechanics, engineers, vendors and users, the Caltrans Equipment Division has found a way to do the job right.

For a tour of the shop, contact Kris Teague, (916) 227-9608. ●



# New Fruitvale

## Oakland's Grand Opening Showcases Station,

Have you ever compared your commute to a reality show? Do you feel like a survivor just for making it through the week?

East Bay commuters now have another option available for the daily grind — a simplified bicycle/transit connection.

For state and local transportation agencies, the mobility needs of the San Francisco Bay Area present a daunting challenge that requires interagency cooperation, public/private partnerships, innovative thinking, and effective use of financial resources.

On November 17, 2004, Caltrans joined several East Bay partners to showcase the Fruitvale Bike Station in Oakland. The recently completed project is in the Fruitvale Village Plaza adjacent to the Fruitvale Bay Area Rapid Transit (BART) station.

The agenda for the grand opening reflected the strong partnership that developed the project. Speakers included the Honorable Ignacio De La Fuente, Oakland City Council President; the Honorable Carole Ward Allen, BART District 4 Director; and Raul Godinez II, Director of the Oakland Public Works Agency.

Attendees enjoyed entertainment that reflected the cultural diversity of Oakland and the Bay Area: lively music from Mariachi El Mexicanísimo and dancers in traditional attire from Ballet Folklórico Maestros Del Folklor Mexicano. Fruitvale Village merchants provided snacks and refreshments.

The BART station is the focal point of the Fruitvale Village Plaza, a unique smart-growth, mixed-use development. The project is a product of public, private and nonprofit efforts to revitalize a community.

The partnership included the City of Oakland, the BART District, the Unity Council, and the Fruitvale Development Corporation. Once the site of a parking lot, the Fruitvale Village Plaza is now a lively hub of

activity that connects walkers, bicyclists, and transit users to new housing, offices, retail businesses, and community services.

As a major intermodal transfer facility, the station serves commuters with 11 Alameda/Contra Costa Transit lines (with bus mounted bicycle racks), and carpooling, vanpooling, and taxi facilities. A shortage of automobile and bicycle parking had been an issue for several years. Prior to the development of the bike station, daily demand for bicycle racks and bicycle lockers exceeded capacity.

The shortages forced many commuters to drive rather than bicycle to the station. With vehicle parking lots reaching capacity by 7 a.m., commuters would circle the station and the surrounding neighborhood in search of scarce parking. Abandoned lots in the neighborhood and the adjacent railroad right of way absorbed the overflow.

To address the bicycle parking shortage, the city considered the bike station concept, which is modeled after similar bicycle facilities developed by transit systems in Europe and Japan.

Secure bicycle parking — for a venerable beach cruiser or an ultra-light racer — is a key factor in the decision to commute by bicycle. The bike station's free indoor parking system stores four bicycles vertically in a device that occupies the same floor area as one traditional rack or locker. With capacity for 240 bicycles, it is the largest facility in California and the second largest in the nation.

*(continued on page 18)*



# *Bike Station*

*Reflects City's Cultural Diversity*

*By David Priebe*

*Bicycle Transport Account Program Manager*

*Caltrans Division of Local Assistance*





The Fruitvale Bike Station also offers full repair service and a retail bike shop. For bicycle commuters, the additional services are the icing on the cake, making the bicycle portion of the commute even more attractive.

The fifth such facility in California, the Oakland project follows the lead of Bike Station Long Beach, which was the first of its kind in the United States when it opened in 1996. The success of the Long Beach project spawned a growing network of California bike stations including Bike Station Berkeley at the Downtown Berkeley BART Station, Bike Station Palo Alto at the Caltrain Depot in Palo Alto, and Bike Station Embarcadero at the downtown San Francisco Embarcadero BART Station.

Similar facilities exist in Denver, Chicago, and Seattle. According to the Bike Station Coalition, the nonprofit organization that encourages and monitors development of similar projects, 57,200 bicycles were parked in the Long Beach, Berkeley, Palo Alto, San Francisco, and Seattle bike stations in 2004.

All bike stations provide supervised, secure, short-term or overnight bicycle parking and access to public transportation. Several offer other services and amenities such as bicycle repair, retail and accessory sales, rentals, changing rooms, outdoor seating areas with concessions, car sharing, and Internet access.

Bike stations can help workers who live a considerable distance from their destination — but near a transit

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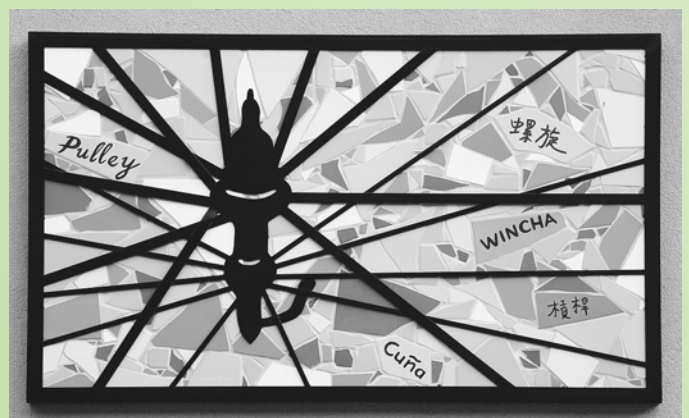
*Caltrans is committed to both “smart growth” and multi-modal transportation. Bike stations such as the recently opened Fruitvale Bike Station in Oakland are a key element in both strategies, lending support to transit villages and to mobility with an intermodal twist.*

station — to incorporate bicycling into the commute trip. A commuter using bike station services might bicycle from home to a bus stop, secure the bike on the bus bicycle rack, and ride the bus to the transit terminal or train station. At the transit terminal, the bicyclist checks the bicycle into the bike station and boards a regional rail service to complete the commute trip.

Another scenario might include a walking trip to the transit station, where the commuter boards the regional light rail train. When the train arrives at a rail terminal that includes a bike station, the commuter retrieves the bicycle, which was stowed safely away the previous evening, and pedals the final leg of the commute.

Kathryn Hughes, the Bicycle/Pedestrian Program

Manager for the City of Oakland’s Public Works Agency, envisions additional bike stations as part of a region-wide strategy to reduce drive-alone trips to transit stations. Such a network would allow commuters to ride a bicycle to one bike station, take transit to another, and use a subsidized rental bicycle to reach the final destination.



## OAKLAND'S STATION RESEMBLES BIKE STATION LONG BEACH, THE FIRST OF ITS KIND IN THE UNITED STATES WHEN IT OPENED IN 1996.

In addition to giving commuters more choices, the bicycle/transit linkage improves the neighborhood by decreasing automobile trips and parking demand while improving local air quality.

Professionals in community planning, transportation, and public health emphasize the importance of increasing physical activity through land use patterns and transportation systems that encourage more bicycling and walking. The Fruitvale Bike Station provides an opportunity to add exercise, in the form of a bicycle trip, to the daily commute.

Funding for the \$800,000 project included \$400,000 from the Transportation Fund for Clean Air, awarded to BART by the Alameda County Congestion Management Agency. The City of Oakland secured \$400,000 from the Bicycle Transportation Account (BTA), an annual grant/reimbursement program that provides state funds for city and county projects that improve safety and convenience for bicycle commuters.

The Bicycle Facilities Unit in the Caltrans Division of Local Assistance and the District Local Assistance Engineers administer the program. Eligible project types are: bikeways, bicycle parking, bicycle racks on public transit vehicles, traffic control devices, and safety improvements and maintenance on existing bikeways.

The BTA also contributed funds to bike stations at the San Francisco Embarcadero, Palo Alto, Long Beach, and a new facility to be located near one of the Metro Gold Line Stations in Pasadena.

The Department applauds local leaders who have had the vision to develop this innovative project. With continued support from state and local agencies and the community, the Fruitvale Village Plaza and Fruitvale Bike Station will serve local commuters and become national models for transit-oriented development and multimodal connectivity. •





# California Travelers Use CHIN in Record Numbers to Prepare for Winter Storms

By Steve Takigawa

Chief, Caltrans Division of Maintenance

A SERIES OF powerful storm systems appeared on Doppler radar last winter bringing heavy loads of wet weather. In December and January, they made landfall, soaking low-lying areas of Central and Southern California in heavy rain while burying the state's mountains in snow.

In anticipation, millions of Californians made sure their survival kits included the phone number of the Caltrans Highway Information Network (CHIN).

“When the weather's bad and you have to get somewhere, who ya gonna call? 1-800-427-ROAD,” said Len Nelson, Chief of the Caltrans Emergency Operations Office, which oversees CHIN.

And people did — in record numbers.

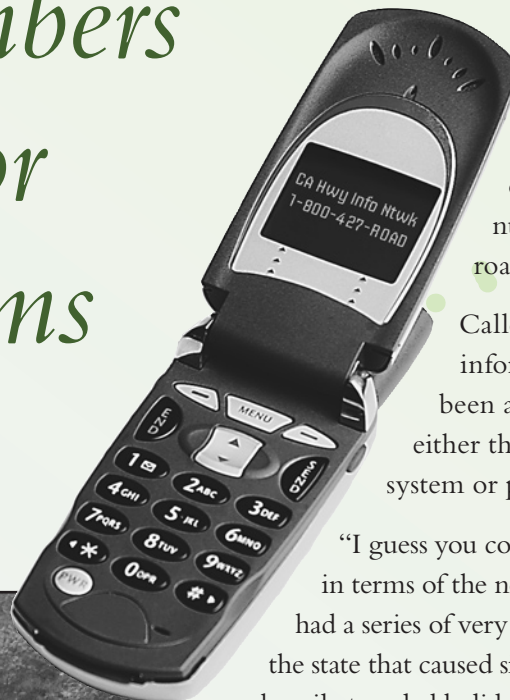
From the time the first major storms began the last week of December, until nature spent its fury in February, more than one million callers dialed the CHIN number to hear the latest road conditions.

Callers had quick access to road information on routes that had been affected by the weather — either through the voice-activated system or phone keypad.

“I guess you could say we had a ‘perfect storm’ in terms of the need for road information. We had a series of very powerful weather systems hit the state that caused significant damage during a heavily traveled holiday season,” said Nelson.

On December 30, the CHIN handled 189,694 calls, followed by more than 184,000 on January 7. By January 11, another 779,406 queries came in.

It was all about service in CHIN's nerve center, the Caltrans Headquarters Maintenance Communication Center in Sacramento.



*When the weather's bad...*  
*who ya gonna call?*  
**1-800-427-ROAD.**

The 10-person staff provided around-the-clock coverage to ensure that the CHIN had up-to-date information.

"It's easy to get caught up in the gross number of calls but it really comes down to each individual inquiry," said Mark Almeida, supervisor of the Communications Center. "Most people are interested only in their specific route. They don't really care what is happening elsewhere or the challenge we have in making sure the information is accurate and current."

"We know that every second is precious for motorists. Armed with the latest information, they may be able to turn around, avoid a delay or change their plans," Almeida added. "We take every situation like that as our challenge. After all, we exist to help people get where they want to go safely and with as little inconvenience as possible."

While the storms raged, information poured into the Communications Center. One minute it was an update about a slip-out on Highway 154 in Santa Barbara County and the next the imposition of chain controls on Interstate 80.

In each case, a CHIN dispatcher wrote up the information for placement on the Caltrans Web site while another dispatcher changed the recorded phone message. It took less than five minutes to receive the data and place it on the CHIN.

In addition to the CHIN number, the latest road condition information was available on the Caltrans Web site at [www.dot.ca.gov/hq/roadinfo/](http://www.dot.ca.gov/hq/roadinfo/). The road condition web link recorded 567,471 hits in January.



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*Winter storms hit California with both ferocity and duration. However, record numbers of Californians called into the Caltrans Highway Information Network (CHIN) for helpful, timely information about the weather and road conditions.* PHOTOS COURTESY OF LEN NELSON

Most of the damage from the storms was in Central and Southern California. A total of 871,507 CHIN calls in January were for road information along Interstate 5, which had both storm damage and heavy snows on the Grapevine north of Los Angeles.

More than a quarter of a million callers punched the number for information about Highway 18, a major route into the Big Bear/Lake Arrowhead area in the San Bernardino Mountains. More than 700,000 calls came in for road conditions on Interstate 80 and Highway 50, Northern California's two trans-Sierra highways to ski resorts.

Subsequent storms in 2005 pushed damage estimates to \$130 million or more, and Caltrans contracted for 76 emergency projects valued at \$73 million in Districts 5 (San Luis Obispo), 7 (Los Angeles/Ventura), 8 (San Bernardino), 11 (San Diego) and 12 (Orange County).

Through it all, the CHIN remained a reliable information source for millions of motorists venturing out on California's highway system. ●

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